

2.—Clastic dykes at Albany, Western Australia

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Manuscript received 22 August 1972; accepted 20 February, 1973.

Abstract.

Four clastic dykes outcrop on the northern shore of the entrance channel of Princess Royal Harbour, Albany. The largest dyke is about 1 metre wide, the others less than 10 cm wide. All are made up of well lithified, quartz-rich, wacke-type sediment and are enclosed by biotitic granitic gneiss.

Introduction

Clastic dykes have been observed at several widely scattered localities in Western Australia, for example at Watheroo, the Billeranga Hills, Puntapin Hill, Dillon Bay and Albany. Of the known examples, only those at Watheroo have been described (Logan 1958). The purpose of this paper is to record the occurrence at Albany.

Description of dykes

The clastic dykes at Albany outcrop on the northern shore of the entrance channel of Princess Royal Harbour, as shown in Figure 1. Access is by bitumen road from the Albany townsite. The dykes cut across a flat gneissic pavement which is about 10 metres wide, and continue northward beneath unconsolidated sand and southward under the harbour waters; it is, therefore, not possible to see their full length. These dykes trend approximately 300°, almost at right angles to the shore line, and dip 80° to 85° W. A third dyke extends south-



Figure 2.—General view looking south along the strike of the largest dyke. This dyke is about 1 metre wide.

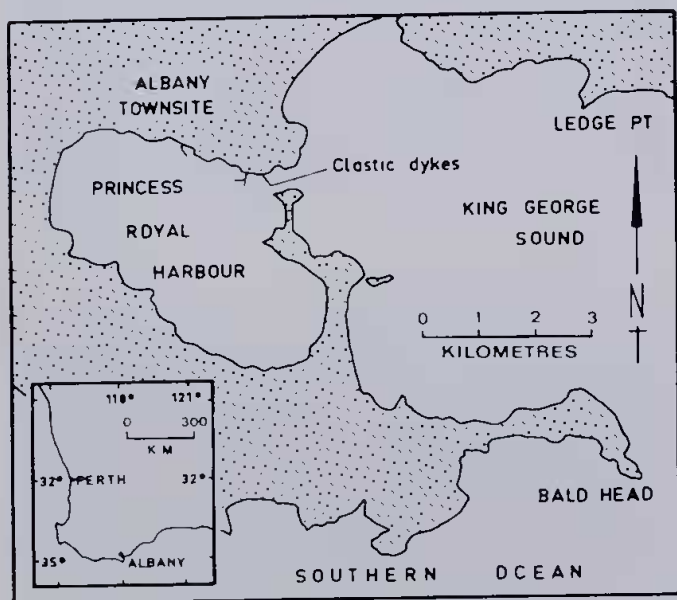


Figure 1.—Locality map.

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ward from the shore line and at very low tide its northern few metres are exposed. A fourth dyke occurs on a small, rather rough gneissic headland immediately east of the pavement. The widest dyke is about 1 metre in width and is shown in Figure 2; the others are narrower, averaging less than 10 cm in width. They are well lithified and are as resistant to marine erosion as the adjacent gneiss.

The dykes simulate normal intrusives, and their clastic lithology is not obvious unless looked at closely. Included fragments of gneiss have the appearance of xenoliths. Margins, particularly those of the widest dyke, are possibly offset, but foliation patterns in the

gneissic country rock are not sufficiently distinctive to allow indisputable matching. The dykes are enclosed by biotitic granitic gneiss which has a foliation trending 250° and dipping 65° N. Numerous joints cut the dykes in a diagonal pattern and many continue without refraction across the dyke boundaries into surrounding gneiss.

The dykes are made up of well-lithified, quartz-rich wacke-type sediment. Detrital particles include quartz, quartzite, microcline, plagioclase, pinitized cordierite, zircon, apatite and rare fragments of gneiss; quartz grains make up approximately 70 per cent. Size sorting is very poor, and grains range from less than 0.05 mm to more than 4 mm across. Roundness and sphericity are also variable, and all gradations from well-rounded, sub-spherical grains to sharply angular fragments are present. The boundaries of many grains are irregular and embayed as a result of marginal solution and matrix encroachment.

Between 5 and 15 per cent of the rock is made up of matrix, originally clay, but now chlorite, biotite, muscovite and limonite. Matrix in the narrow dykes is mostly fine-grained dark green chlorite, with rare flakes of muscovite and biotite, whereas in the widest dyke it is limonite and muscovite. This difference is expressed in the greyish green colour of the narrow dykes and the

dark purplish brown of the widest dyke. Seemingly, the original clay matrix was altered to chlorite, which in turn partly altered to biotite and muscovite in the narrow dykes and almost completely altered to muscovite and limonite in the widest dyke. The alterations are probably authigenic, but the possibility of slight metamorphism cannot be excluded. Reasons for the matrix differences are unknown. Secondary muscovite flakes range in size up to 0.05 mm in thickness and more than 0.8 mm across, and commonly are moulded around detrital grains. Penetration into detrital grains is rare. The lithification and secondary mica development suggest that the clastic dykes are not recent, and may be of considerable age. Sediments comparable with the dykes are not known elsewhere in the Albany area.

Specimens of the Princess Royal Harbour clastic dykes are housed in the rock collection of the Department of Geology, The University of Western Australia; the largest dyke is represented by specimens 44933 and 48211, the smaller dykes by specimens 44934 and 48210.

Reference

- Logan, B. W. (1958).—Clastic Dykes from Watheroo, Western Australia. *J. Roy. Soc. W. Aust.* 41: 27-28.